1987: The Parking Lot Problem

The owner of a paved, 100-ft-by-200-ft, corner parking lot in a New England town hires you to design the layout, that is, to design how the "lines are to be painted."

You realize that squeezing as many cars into the lot as possible leads to right-angle parking with the cars aligned side by side. However, inexperienced drivers have difficulty parking their cars this way, which can give rise to expensive insurance claims. To reduce the likelihood of damage to parked vehicles, the owner might then have to hire expert drivers for "valet parking." On the other hand, most drivers seem to have little difficulty in parking in one attempt if there is a large enough "turning radius" from the access lane. Of course, the wider the access lane, the fewer cars that can be accommodated in the lot, leading to less revenue for the parking lot owner.

Comments by the Contest Director

The problem was contributed by Maurice D. Weir (Mathematics Dept., Naval Postgraduate School, Monterey, CA).

Of the 156 papers entered in the Contest, 125 dealt with this problem. The Outstanding papers were by teams from Calvin College and Rensselaer Polytechnic Institute, both of which concluded that the lot could be designed to hold more than 75 average-sized cars. Their papers, together with commentaries, were published as follows:

Bingle, Richard, Dan Meindertsma, and William Oostendorp. 1988. Designing the optimal placement of spaces in a parking lot. *The UMAP Journal* 9 (1) (1988): 13–35.

Special Issue: Mathematical Competition in Modeling. 1987. *Mathematical Modeling: An International Journal* 9 (10): 765–784. This special issue contains all four Outstanding papers.